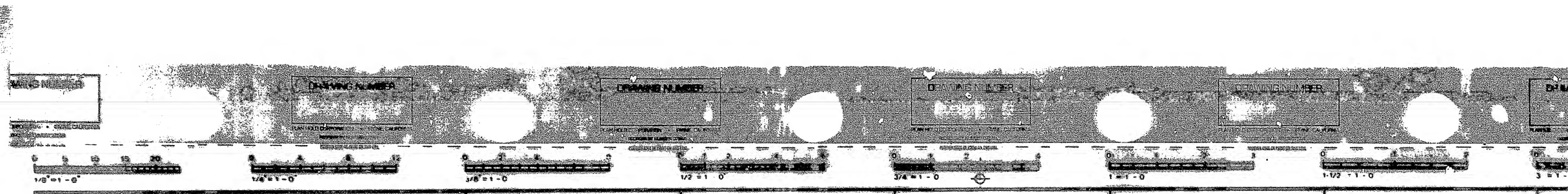


SMOKE DETECTION SPECIFICATIONS

Part 1 - GENERAL

1.01 GENERAL DESCRIPTION

A. Furnish and install a detection system and all associated equipment required for proper operation as specified herein and as shown on the Contract Drawings.

B. All equipment shall be accompanied by complete service notes of the manufacturer and drawings detailing all interconnections.

C. The system shall conform to the requirements of the Fire Department of the City of N.Y. Fire Prevention Directive 3-74.

D. Equipment furnished hereunder shall conform in concept to the details shown on the Contract Drawings and be as described in the Specifications and required for the intended operation.

E. All wiring shall be as shown on the Contract Drawings and as required for proper operation and interconnection of all equipment.

F. All wires and cables and equipment shall be approved by the Board of Standards and Appeals of New York City.

G. Additional or larger wire, conduits, terminal boxes and all other equipment over and above those shown on the Contract Drawings shall be furnished without extra charge if required for the proper operation of the system.

1.02 SHOP DRAWINGS

Prior to fabrication, prepare and submit for approval, shop drawings, wiring diagrams and catalog cuts, including an overall block diagram of the smoke detection system, number and type of components to be furnished and complete technical information for item or component listed. Submissio shall demonstrate compliance with all requirements of the Specifications and Contract Drawings.

1.03 OPERATION AND MAINTENANCE MANUALS

A. Furnish to the Engineer bound and indexed copies of an approved operations and instruction manual for the Smoke Detection System.

B. The manuals shall provide complete instructions on the proper operation and use, lubrication and periodic maintenance, trouble shooting, together with the source or replacement parts and service for the item of equipment or the system covered.

1.04 SYSTEM OPERATION

A. The circuits shall be arranged so that grounds, opens or shorts, etc. in any wiring of the system will cause a visual trouble indication at the control cabinet and a trouble bell to operate.

B. The system shall operate as follows for each protected area:

1) Smoke Detection - When one detector is activated the following shall occur:
   a. The alarm and zone indication lights shall operate at the smoke detection control panel.
   b. The area alarm bell shall sound, and visual indicator will go on inside the protected area.
   c. The associated room fans and air conditioning unit shall shutdown and dampers shall operate.
   d. An alarm and trouble signal shall be provided to the WTC police desk via nearest existing RMT Cabinet.

PART 2 - PRODUCTS

2.01 SMOKE DETECTION SYSTEM

A. The smoke detection system shall be "System 3" manufactured by Pyrotronics. No substitutions will be allowed for the Pyrotronics equipment specified herein.

B. Smoke Detection Control Panel: The control panel shall provide for the following items and functions:

1. Provide necessary power for operation of smoke detector circ s and all required equipment.
2. Sound a local alarm bell, trouble bell and strobe lights.
3. Supervise the detector circuits and all required relay coils.
4. Trouble indicator lamp.
5. Separate indicator lamps for the following:
   a. Smoke detection - one lamp per zone.
6. One set of alarm and one set of trouble operated single-pole, double-throw, normally closed relay contacts.
7. Silencing and reset switches.
8. All necessary relays and other equipment required for operation as described herein and shown on Contract Drawings.

C. Smoke Detectors: Smoke Detectors shall be as follows: Smoke detectors shall operate on the ionization principle and shall be activated by the presence of combustion products. The detector head shall be a plug-in unit containing two ionization chambers, amplifier switching circuit and indication lamp. The unit shall contain no moving parts. It shall be equipped with an integral alarm lamp and a base. Smoke detectors shall be Model DI-4 manufactured by Pyrotronics.

D. All required smoke detection zones shall be obtained by installation of input modules, Dual Ion Zone Model ZN-32 manufactured by Pyrotronics

E. The Supplementary Relay Modules, Model SR-32 manufactured by Pyrotronics shall be installed to operate the following external devices: HVAC unitshut-downs, audible and visual alarms.

F. Control panel and all modules shall be mounted in a common sheet metal enclosure. The enclosure shall be provided with a hinged cover, and a lock with keys matching existing keying system.

G. A standby power supply consisting of a sealed gelled electrolyte type battery and a battery charger to operate the smoke detection system in case of power failure shall be mounted in the same enclosure. It shall transfer automatically on power failure.

H. The visual annunciator (strobe light), shall be manufactured by Pyrotronics Inc., Model V-33

2.02 WIRING

All wires and cables shall be multiconductor type teflon insulated with teflon jacket. Cable shall be marked "Fire Alarm Service" at regular intervals throughout its length, and approved for use in Class "E" Fire Alarm Systems. All wiring shall be installed in accordance with requirements of the New York City Building Code for modified Class E Systems. In addition, all wiring shall be installed in threaded galvanized conduit to conform to the PANYNJ Tenant Construction Review Manual.

2.03 NAMEPLATES

A. Nameplates shall be fabricated from plastic, with letters engraved white on black background.

B. Zone identifications shall be typewritten.

PART 3 - EXECUTION

3.01 INSTALLATION

Install the smoke detection system in accordance with the Contract Drawings and as specified herein.

The system shall be provided complete with all outlet boxes, junction boxes, cabinets, etc., regardless of whether or not such items are furnished as integral parts of the equipment. All conduit and wiring installed in areas with finished hung ceilings shall be concealed.

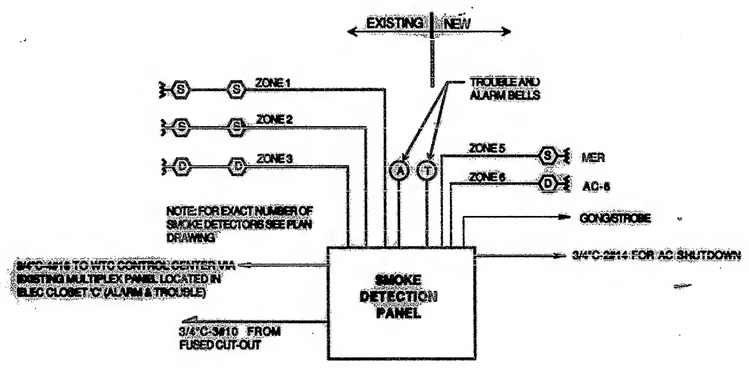
3.02 FIELD TESTS

A. After installation, system performance tests, including start-up and calibration of all components with all devices connected to the permanent construction, shall be conducted before any other tests are conducted.

B. The Contractor shall have the test procedure submitted to the Engineer for approval.

C. The tests shall be witnessed by the Engineer and shall continue until the results are satisfactory to the Engineer.

D. The tests shall be performed by a certified technician (factory trained) using the manufacturer's recommended test procedures and equipment.



SMOKE DETECTION WIRING DIAGRAM